VATSALYA PATIDAR

Backend Developer | AI / ML Engineer | LLM Engineer

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PROFESSIONAL SUMMARY

Electronics and Computer Engineering student (graduating July 2029) with a strong focus on backend development, AI/ML, and LLM engineering. Skilled in building scalable APIs, computer vision pipelines, and geospatial data systems. Active competitive programmer with consistent practice in data structures and algorithms.

EDUCATION

Bachelor of Technology (B.Tech), Electronics and Computer Engineering (ECM) Expected Graduation: July 2029

VIT Chennai | CGPA: 8.74

Class XII: 89% | Class X: 88.83%

TECHNICAL SKILLS

Languages: C, C++, Python, JavaScript, TypeScript, SQL, Verilog HDL

Backend: Node.js, Express.js, REST APIs

AI / ML: OpenCV, NumPy, Pandas, Scikit-learn, Computer Vision, Image Processing, Signal Processing

Frontend / Mobile: React, React Native, Next.js, Expo, HTML, CSS

Cloud & Database: Firebase Authentication, Firestore, Firebase Storage

Embedded Systems: ESP32, Arduino, Sensors (HC-SR04, INA219), LCD Interfacing

Geospatial: GeoPandas, Rasterio, RasterStats, NDVI Analysis

Tools: Git, GitHub, VS Code, Android Studio, MATLAB, Jupyter Notebook, Postman

PROJECTS

Landroid — AI-Powered Land Intelligence Platform *Python, React Native, Firebase, GeoPandas, Rasterio, OpenCV*

- Built a Python backend for geospatial analysis of drone orthomosaic imagery to assess vegetation health, land valuation, acreage estimation, and tree counting.
- Calculated NDVI vegetation health scores and integrated Firebase for real-time data synchronization.
- Developed the companion Android application using React Native and Firestore.

AI Hotel Booking Automation *Multi-Agent Architecture, NLU*

- Designed an intelligent multi-agent system that interprets natural language booking requests, searches multiple hotel providers, and filters results by location, budget, and rating.
- Implemented constraint optimization with a user-confirmation step before finalizing reservations.

Hand Cleanliness Detection System *ESP32, Python, Computer Vision*

- Built an embedded AI system using an ultrasonic sensor for hand detection and a Python CV server for real-time cleanliness scoring.
- Integrated wireless communication and an LCD display for live feedback.

BenchBuilder — Verilog Testbench Automation *Verilog HDL, Shell Scripting*

- Created a utility to auto-generate Verilog testbenches, streamlining hardware verification workflows.

Signal Processing: STFT vs. Wavelet Transform *MATLAB*

- Performed a comparative analysis of STFT and Wavelet Transform for stationary and non-stationary signals.

PROBLEM SOLVING & COMPETITIVE PROGRAMMING

- Active on LeetCode (leetcode.com/u/vatsalya_39); solves problems in Arrays, Strings, Sliding Window, Two Pointers, Binary Search, Trees, Hash Maps, Graphs, and Dynamic Programming using C++.

RELEVANT COURSEWORK

Data Structures & Algorithms, Digital Logic & Computer Architecture, Signal Processing, Object-Oriented Programming, Embedded Systems